

SCUD, SCALEBOARD, and Scuttlebutt

by Captain Scott R. Gourley

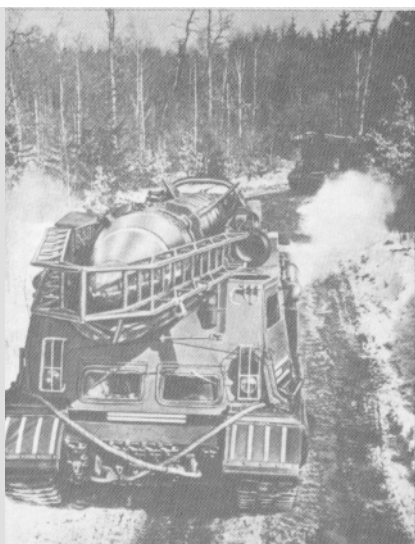
During their drives against Nazi Germany in the latter years of World War II, the military forces of the Allied power captured numerous German defense plants and production factories along with much of the engineering talent required to operate the facilities. It is no secret that the Allied nations put some percentage of these individuals and their equipment into their own service during the ensuing Cold War. One of the "finds" that held the greatest interest for both eastern and western military forces was the German V-2 rocket and its associated technology.

In the Soviet Union, the S. P. Korolev Design Bureau used the V-2 as a starting point for its experiments into new generations of Soviet tactical-range missiles. By the late 1940s and early 1950s the Bureau was developing test bed systems that would become known as the SS-1 and SS-2. These long-range tactical missile would become a vital part of Soviet military thinking.

Thirty-five years and several technological generations later, the V-2 technology and the early Soviet test beds have evolved into two battlefield systems that provide the Soviet Army and Front commanders with increased tactical flexibility and long-range conventional, chemical, and nuclear firepower. The systems, known by the US designations SS-1c and SS-12, are most familiar under their NATO code names, SCUD and SCALEBOARD.

The SCUD A (SS-1B) missile system was first seen in 1957 during the same parade that initially displayed the FROG 1 and was carried on the same basic JS3 tank chassis. The modified chassis featured a built-up area for the operating crew while the missile sat in a frame structure that extended beyond the front of the vehicle and around the nose of the missile. Unlike the FROG, the SCUD missile was fueled with liquid propellant. The missile was 10.4 meters long and credited with a range of 180 kilometers.

During the Moscow parade on 7 November 1961, the SCUD B (SS-1c) made its first public appearance. Visible differences from SCUD A included additional air bottles on each side of the vehicle cab and a longer missile (11.4 meters). The SCUD B was credited with improved range, guidance, and reliability characteristics over SCUD A. Contrary to one commonly held belief, the SCUD B initially appeared on the same modified tank chassis as the SCUD A. Four years after its public debut, the SCUD B appeared on an MAZ-543 chassis, an eight-wheeled transporter-erector-launcher that could be reloaded after firing.



SCUD-A on modified tank chassis.

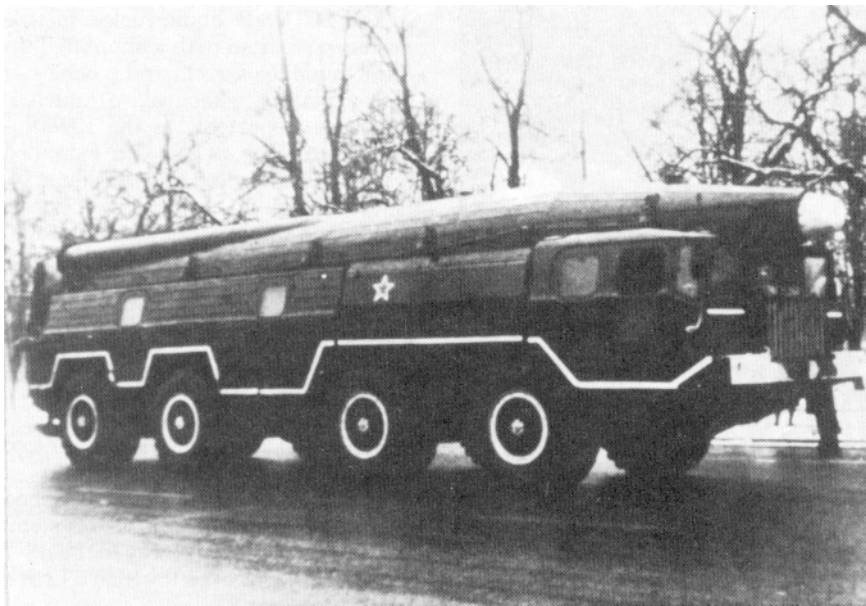
The SCUD B liquid-fueled missile has been credited with a simplified inertial guidance system and a choice of high-explosive, chemical, or nuclear warheads (reportedly in the 100-kiloton class). The SCUD B's extended range is usually cited as 280 kilometers (shorter range for the nuclear option).

Of some interest are the occasional open source reports of a "SCUD C" missile. Some sources report that the SCUD C is larger than the SCUD B with a range of 450 kilometers. Other unclassified US Army sources call the 450-kilometer system the KY-3 SCUD. Still other references say that the designation stems from confusion over two SCUD B launch vehicles.

As the early Soviet test beds reached toward a longer-range missile system, the SS-1 and SS-2 gave way to the SS-1 SHYSTER. However, the SHYSTER's



Training with SCUD-B.



The massive SCALEBOARD on parade.

simple rail and pad transport and launch structure would have been extremely vulnerable in combat. The solution was the introduction of the SS-12 SCALEBOARD, first seen in November 1967 and deployed on the same MAZ-543 eight-wheeled transporter-erector-launcher as the SCUD. The SCALEBOARD missile itself is housed and transported inside a ribbed container which is only removed after erection to the vertical launch position. The SCALEBOARD is credited with a maximum range of 900 kilometers; theoretically, launchers in East Germany could strike England. For many years the SCALEBOARD was credited with only a nuclear warhead option in the megaton range; however, recent events lend *strong* support to the existence of at least one nonnuclear option. The split cab of the MAZ-543 transporter-erector-launcher houses the firing crew. The vehicle driver sits in the left cab with some crew members behind him while the launch operator sits in the right cab with his control console and other crew members.

In a combat situation, the SCUD launchers will probably be deployed individually to avoid detection of the entire firing unit. The SCUD brigade's three launch battalions, each containing from three to nine transporter-erector-launchers, will remain under the direct control of the Army and Front commanders and their Chiefs of Rocket Troops and Artillery (CRTA). The four

transporter-erector-launchers in each of the three launch battalions making up the Front's SCALEBOARD brigade will remain deep in the zone of the front and be controlled by the Front commander and his

Chief of Rocket Troops and Artillery.

In the last few years, many publications have begun referring to "follow-up" systems for both the SCUD and SCALEBOARD. The follow-ons are being labelled the SS-23 and SS-22, respectively. The SS-23 is reportedly replacing the SCUD missile during the early-to-mid 1980 time frame. It will be carried on the same transporter-erector-launcher, and its primary improvements reportedly include increased range (500 kilometers) and improved accuracy.

The SS-22, first deployed in 1978, is replacing the SS-12 SCALEBOARD system. Like the SS-23 improvements over the SCUD, the SS-22 provides longer range (1,000 kilometers) and greater accuracy than the SCALEBOARD.

In addition to increasing Soviet battlefield capabilities, the introduction of a new generation of follow-on systems potentially frees some of the earlier weapons for wider export to the third world. In fact, the Soviets began exporting the SCUD outside the Warsaw Pact as early as 1973, even before the reported fielding of the SS-23.

The decision to ship SCUD battlefield missiles to Egypt was apparently made in March 1973 during the Cairo visit of a senior Soviet military delegation. The first SCUDs reportedly began arriving during April. The arrival of the SCUDs was significant in three respects. First of all, it marked the first time that these systems were shipped outside the Warsaw Pact. Second, it provided the Egyptians with "regionally strategic" weapons; that is, Egyptian SCUDs located near Port Said could theoretically strike several southern

coastal cities in Israel. Finally, and perhaps most importantly, even though the SCUDs were serviced and partially operated by Soviet "advisors," they were reportedly placed under the operational control of Egypt.

By the start of the October War, the Soviet Union had supplied the Egyptians with an estimated 30 SCUDs (the Syrians did not receive any SCUDs during this period). In a speech before the Egyptian People's Assembly on 16 October, President Sadat said:

"Our Egyptian Sinai-traversing Zafer missiles are now on their pads ready for launching at a single signal to the depth of Israel."

It is believed that this was a veiled reference to the possibility of using SCUDs, not Zafirs (Zafers), in retaliation against deep Israeli airstrikes. The Zafir was designed in Egypt in the early 1960s by German technicians. Unresolved guidance system difficulties reportedly kept the Zafir from full deployment. The actual combat firings of SCUD missiles during the October War was widely ignored by the western press. Those sources that do report the incident are not even in complete agreement on the number of SCUDs fired. However, these sources are in general agreement that on 22 October, six days after Sadat's warning speech, the Egyptian Army fired a small number of SCUDs against Israel. All of the SCUDs carried conventional warheads. Whether or not Moscow formally approved the launchings, the Soviet advisors certainly cooperated in the action, implying Soviet willingness to escalate the conflict.

Apparently the SCUD firings had questionable effect on their intended targets. Major General Chaim Herzog, former head of Israeli Military Intelligence, dismisses the results of the firing with the single statement: "It landed in the desert of Sinai."

The months and years following the October War saw wider export of the SCUD, quite possible facilitated by the introduction of the SS-23 into Soviet units. Open sources credit at least Iraq, Libya, and Syria with receipt of the systems. During November 1975, the Syrian Army reportedly test-fired a SCUD over a distance of approximately 250 kilometers.

The next reported combat use of the SCUD system occurred during the Iran-Iraq conflict in December 1983 when sources stated that Iraq fired a series of SCUD B missiles at the Iranian Oil facilities on Kharg Island. Early reports cited analysts' predictions that the SCUD B's circular error probable of 1,000 meters meant that the Iraqis would have to fire up to 10 SCUDs in order to hit the terminal. Later reports cited "little significant damage."

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If the introduction of the SS-23 provided SCUD systems for export, perhaps fielding of the SS-22 has freed some of the massive SCALEBOARD systems for use by "client states." As mentioned earlier, for many years the SCALEBOARD was publicly credited with only a nuclear warhead option. This limited option appears extremely unlikely in light of reports published in early 1984.

In February, 1984, widely respected defense sources began to report Iraqi receipt of a number of SS-12 SCALEBOARD missiles from the Soviet union. Even without the nuclear option, the greatly increased range of the SCALEBOARD provided Iraq with a tremendous new deep strike capability.

Most publications ignored the significance of the SCALEBOARD's arrival.

More disturbing than the arrival of the missiles is the possible command and control relationship that was created. Looking back at the first SCUD exports a decade earlier, Soviet soldiers were reportedly used to service and operate the systems. Has the Soviet Union made the same troop commitment to Iraq?

In light of the apparent willingness of many third world countries to use these huge "regionally strategic" battlefield missiles, the Soviet Union's expanding export of these systems is a dangerous trend. Perhaps most ominous is the reported addition of the SCALEBOARD system to the export list. As both systems are increasingly fielded in the world's trouble spots, there is a sad probability that the rockets and their terminal effects will become more familiar

to soldiers and civilians alike. Members of the US military and their allies simply cannot afford to ignore the capabilities of these weapon systems or to overlook them in future targeting efforts wherever the SCUD or SCALEBOARD might be employed. 

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Movers and Shakers—Doers or Thinkers?

by MAJ Roger A. Rains

Organizational excellence begins with the individual, and individual excellence derives from excellent institutional training. General George C. Marshall recognized that axiom when he revitalized the infantry school during the inter-war years; Fox Connor manifested this truism in his tutorship of several officers who would eventually lead armies across Europe; and Winston Churchill applauded the American applications of the principle when he told a group of senior officers at the Pentagon in 1946:

Professional attainment, based upon prolonged study, and collective study at colleges, rank by rank, and age by age—those are the title reeds of the commanders of future armies, and the secret of future victories.

In the current era of massive doctrinal, organizational, and material changes this postulate is rarely questioned, but frequently forgotten. Soldiers around the world have become so enamored with "doing" that they have given short shrift to "thinking"; they have been persuaded that the time spent as thinkers, teachers, and students is merely time out of a more important career of action in the field. More than a few officers have suggested that time spent as a student or as an instructor is time wasted. They are wrong. The axiom remains as sound today as it has been throughout history. If we are to have an "Army of

Excellence" we must first have excellent institutional training and trainers. Only by developing military "thinkers" and teachers can we guarantee that when the time comes our "men of action," our doers, will be sufficient to the task.

In a recent article in *Military Review*, Colonel Huba Wass de Czege captured the essence of the argument when he observed: "The fundamental key to controlling and integrating change effectively is to raise the level of the knowledge and practice of the science and art of war in our Army." To turn that "key" of progress the Army's best scientific thinkers and most artful practitioners must become our institutional teachers. The very best of our senior captains, fresh from battery-level command and tours as fire support officers should step forward to become, after a period of historical and doctrinal study, our doctrine writers and our service school instructors. The very best of our battalion commanders should return to the TRADOC community to study and to lead other "thinkers" as together they train the Army's leaders of the future.

The rewards of adhering to the time-honored axiom will be manifold. Not only will the Army's very best catalyze the development of doctrine and the training of future leaders but also these well-practiced "thinkers" will experience the personal benefits of enhanced competence and satisfaction

that come from being the architects of the "Army of Excellence," the Army of the future. When the time comes to be "doers" once more, these professionals who have thought and taught will, like the "thinkers" of yesteryear—Marshall, Bradley, Stillwell, and Patton—be more than sufficient to the task as they lead those who they have taught.

Who then is responsible for applying the principle that excellence in institutional thought and training yields excellence on the battlefield? Certainly the senior leadership of our Army must allocate the necessary human resources and provide the impetus to ensure that TRADOC gets the very best of our potential "thinkers" and teachers. Moreover, the various proponents must see to it that these leaders are provided the opportunity to study and develop. But the critical prerequisite is the recognition by soldiers in the field that the "Army of Excellence," the Army of our future, will be designed, built, and led by those who step forward to think, plan, learn, and teach now. If they are to serve best, those captains, majors, and lieutenant colonels who profess to be exclusively "doers" and "men of action" must commit themselves to become "thinkers" and institutional teachers as well. As history and the finest traditions of American military service make clear, they, the Army, and the nation they serve will be the better for it. 